

AMENDMENTS TO THE CLAIMS

1-2. (Canceled)

3. (Currently Amended) ~~The method of claim 2,~~ A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool, wherein the tool comprises an etch tool adapted to etch features on a semiconductor wafer;

estimating a control variable value [[and]], wherein estimating the control variable value includes estimating an etch rate;

receiving a tool event notification; and

initializing the control model in response to receiving the tool event notification and based on the estimated control variable value.

4. (Canceled)

5. (Currently Amended) ~~The method of claim 2,~~ A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool, wherein the tool comprises a deposition tool adapted to form a layer on a semiconductor wafer;

estimating a control variable value [[and]], wherein estimating the control variable value includes estimating a deposition rate;

receiving a tool event notification; and
initializing the control model in response to receiving the tool event notification and
based on the estimated control variable value.

6. (Canceled)

7. (Currently Amended) ~~The method of claim 6,~~ A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control
an operating recipe of the tool, wherein the tool comprises a polishing tool adapted to planarize a
semiconductor wafer;

performing a qualification procedure on the tool in response to receiving the tool event
notification to determine a control variable value, [[and]] wherein performing the qualification
procedure comprises processing a test wafer in the polishing tool to determine a blanket wafer
removal rate;

receiving a tool event notification; and
initializing the control model in response to receiving the tool event notification and
based on the control variable value.

8. (Previously Presented) A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control
an operating recipe of the tool;

receiving a tool event notification;
initializing the control model in response to receiving the tool event notification,
initializing the control model comprising:
performing a qualification procedure on the tool in response to receiving the tool
event notification to determine a control variable value, wherein the tool
comprises a photolithography stepper adapted to expose a photoresist
layer on a semiconductor wafer, and performing the qualification
procedure comprises processing a test wafer in the photolithography
stepper to determine an overlay characteristic of the photolithography
stepper; and
initializing the control model based on the control variable value.

9. (Previously Presented) A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool;

receiving a tool event notification;
initializing the control model in response to receiving the tool event notification,
initializing the control model comprising:

performing a qualification procedure on the tool in response to receiving the tool
event notification to determine a control variable value, wherein the tool
comprises a deposition tool adapted to form a layer on a semiconductor
wafer, and performing the qualification procedure comprises depositing

the process layer on a test wafer in the deposition tool to determine a deposition rate; and

initializing the control model based on the control variable value.

10. (Previously Presented) A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool;

receiving a tool event notification;

initializing the control model in response to receiving the tool event notification,

initializing the control model comprising:

performing a qualification procedure on the tool in response to receiving the tool event notification to determine a control variable value, wherein the tool comprises an etch tool adapted to etch features on a semiconductor wafer, and performing the qualification procedure comprises etching a test wafer in the etch tool to determine an etch rate; and

initializing the control model based on the control variable value.

11-13. (Canceled)

14. (Currently Amended) ~~The method of claim 1,~~ A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool, wherein the tool comprises an etch tool having a chamber;
receiving a tool event notification, [[and]] wherein receiving the tool event notification comprises receiving a notification when the chamber is cleaned; and
initializing the control model in response to receiving the tool event notification.

15. (Currently Amended) ~~The method of claim 1,~~ A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool, wherein the tool comprises a deposition tool having a chamber;
receiving a tool event notification, [[and]] wherein receiving the tool event notification comprises receiving a notification when the chamber is cleaned; and
initializing the control model in response to receiving the tool event notification.

16. (Previously Presented) A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool;

receiving a tool event notification; and

initializing the control model in response to receiving the tool event notification, wherein the tool comprises a photolithography stepper adapted to expose a photoresist layer on a

semiconductor wafer, and receiving the tool event notification comprises receiving a notification when a red-blue calibration is performed on the photolithography stepper.

17. (Canceled)

18. (Currently Amended) ~~The method of claim 17,~~ A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool, wherein the tool comprises a polishing tool adapted to planarize a semiconductor wafer;

receiving a tool event notification;

performing a qualification procedure on the tool in response to receiving the tool event notification to determine a control variable, [[and]] wherein performing the qualification procedure comprises processing a test wafer in the polishing tool to determine a blanket wafer removal rate; and

initializing the control model based on the control variable.

19. (Previously Presented) A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool;

receiving a tool event notification;

performing a qualification procedure on the tool in response to receiving the tool event notification to determine a control variable, wherein the tool comprises a photolithography stepper adapted to expose a photoresist layer on a semiconductor wafer, and performing the qualification procedure comprises processing a test wafer in the photolithography stepper to determine an overlay characteristic of the photolithography stepper; and
initializing the control model based on the control variable.

20. (Previously Presented) A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool;

receiving a tool event notification;

performing a qualification procedure on the tool in response to receiving the tool event notification to determine a control variable, wherein the tool comprises a deposition tool adapted to form a layer on a semiconductor wafer, and performing the qualification procedure comprises depositing the process layer on a test wafer in the deposition tool to determine a deposition rate;
and

initializing the control model based on the control variable.

21. (Previously Presented) A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool;

receiving a tool event notification;

performing a qualification procedure on the tool in response to receiving the tool event notification to determine a control variable, wherein the tool comprises an etch tool adapted to etch features on a semiconductor wafer, and performing the qualification procedure comprises etching a test wafer in the etch tool to determine an etch rate; and

initializing the control model based on the control variable.

22-24. (Canceled)

25. (Currently Amended) ~~The method of claim 17,~~ A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool, wherein the tool comprises an etch tool having a chamber,

receiving a tool event notification, [[and]] wherein receiving the tool event notification comprises receiving a notification when the chamber is cleaned;

performing a qualification procedure on the tool in response to receiving the tool event notification to determine a control variable; and

initializing the control model based on the control variable.

26. (Currently Amended) ~~The method of claim 17,~~ A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool, wherein the tool comprises a deposition tool having a chamber

receiving a tool event notification, [[and]] wherein receiving the tool event notification comprises receiving a notification when the chamber is cleaned;

performing a qualification procedure on the tool in response to receiving the tool event notification to determine a control variable; and

initializing the control model based on the control variable.

27. (Previously Presented) A method for initializing process controllers based on tool event data, comprising:

providing a tool having a process controller adapted to employ a control model to control an operating recipe of the tool;

receiving a tool event notification, wherein the tool comprises a photolithography stepper adapted to expose a photoresist layer on a semiconductor wafer, and receiving the tool event notification comprises receiving a notification when a red-blue calibration is performed on the photolithography stepper;

performing a qualification procedure on the tool in response to receiving the tool event notification to determine a control variable; and

initializing the control model based on the control variable.

28. (Canceled)

29. (Currently Amended) ~~The manufacturing system of claim 28,~~ A manufacturing system, comprising:

a tool adapted to process wafers in accordance with an operating recipe;

a process controller adapted to control the operating recipe in accordance with a control model, wherein the process controller is further adapted to receive a tool event notification and initialize the control model in response to receiving the tool event notification; and
~~further comprising~~ a process control server adapted to send the tool event notification to the process controller.

30-31. (Canceled)

32. (Currently Amended) ~~The manufacturing system of claim 31,~~ A manufacturing system, comprising:

a tool adapted to process wafers in accordance with an operating recipe wherein the tool comprises an etch tool adapted to etch features on a semiconductor wafer; and
a process controller adapted to control the operating recipe in accordance with a control model, wherein the process controller is further adapted to receive a tool event notification and initialize the control model in response to receiving the tool event notification, and wherein the process controller is adapted to estimate a control variable value and initialize the control model based on the estimated control variable value, and the estimated control variable value comprises an etch rate.

33. (Currently Amended) ~~The manufacturing system of claim 31,~~ A manufacturing system, comprising:

a tool adapted to process wafers in accordance with an operating recipe wherein the tool comprises a deposition tool adapted to form a layer on a semiconductor wafer; and

a process controller adapted to control the operating recipe in accordance with a control model, wherein the process controller is further adapted to receive a tool event notification and initialize the control model in response to receiving the tool event notification, and wherein the process controller is adapted to estimate a control variable value and initialize the control model based on the estimated control variable value, and the estimated control variable value comprises a deposition rate.

34. (Canceled)

35. (Original) The manufacturing system of claim 29, wherein the process controller is adapted to contact the process control server to schedule a qualification procedure on the tool in response to receiving the tool event notification.

36. (Original) The manufacturing system of claim 35, wherein the tool is adapted to perform the qualification procedure, and the process controller is configured to determine a control variable value based on the qualification procedure.

37. (Original) The manufacturing system of claim 36, wherein the tool comprises a polishing tool adapted to planarize a semiconductor wafer, the qualification procedure comprises processing a test wafer in the polishing tool, and the process controller is configured to determine a blanket wafer removal rate as the control variable value.

38. (Previously Presented) A manufacturing system, comprising:

a tool adapted to process wafers in accordance with an operating recipe;

a process controller adapted to control the operating recipe in accordance with a control model, wherein the process controller is further adapted to receive a tool event notification and initialize the control model in response to receiving the tool event notification; and

a process control server adapted to send the tool event notification to the process controller, wherein the process controller is adapted to contact the process control server to schedule a qualification procedure on the tool in response to receiving the tool event notification, and wherein the tool is adapted to perform the qualification procedure, and the process controller is configured to determine a control variable value based on the qualification procedure, and wherein the tool comprises a photolithography stepper adapted to expose a photoresist layer on a semiconductor wafer, the qualification procedure comprises processing a test wafer in the photolithography stepper, and the process controller is configured to determine an overlay characteristic of the photolithography stepper.

39. (Previously Presented) A manufacturing system, comprising:

a tool adapted to process wafers in accordance with an operating recipe;

a process controller adapted to control the operating recipe in accordance with a control model, wherein the process controller is further adapted to receive a tool event notification and initialize the control model in response to receiving the tool event notification; and

a process control server adapted to send the tool event notification to the process controller, wherein the process controller is adapted to contact the process control server to schedule a qualification procedure on the tool in response to receiving the tool event notification,

and wherein the tool is adapted to perform the qualification procedure, and the process controller is configured to determine a control variable value based on the qualification procedure, and wherein the tool comprises an etch tool adapted to etch features on a semiconductor wafer, the qualification procedure comprises etching a test wafer in the polishing tool, and the process controller is configured to determine an etch rate as the control variable value.

40. (Previously Presented) A manufacturing system, comprising:

a tool adapted to process wafers in accordance with an operating recipe;

a process controller adapted to control the operating recipe in accordance with a control model, wherein the process controller is further adapted to receive a tool event notification and initialize the control model in response to receiving the tool event notification; and

a process control server adapted to send the tool event notification to the process controller, wherein the process controller is adapted to contact the process control server to schedule a qualification procedure on the tool in response to receiving the tool event notification, and wherein the tool is adapted to perform the qualification procedure, and the process controller is configured to determine a control variable value based on the qualification procedure, and wherein the tool comprises a deposition tool adapted to form a process layer on a semiconductor wafer, the qualification procedure comprises forming the process layer on a test wafer in the deposition tool, and the process controller is configured to determine a deposition rate as the control variable value.

41-42. (Canceled)

43. (Currently Amended) ~~The manufacturing system of claim 28, A manufacturing system,~~
comprising:

a tool adapted to process wafers in accordance with an operating recipe, wherein the tool
comprises an etch tool having a chamber; and

a process controller adapted to control the operating recipe in accordance with a control
model, wherein the process controller is further adapted to receive a tool event notification and
initialize the control model in response to receiving the tool event notification and the tool event
notification comprises a notification that the chamber has been cleaned.

44. (Currently Amended) ~~The manufacturing system of claim 28, A manufacturing system,~~
comprising:

a tool adapted to process wafers in accordance with an operating recipe, wherein the tool
comprises a deposition tool having a chamber; and

a process controller adapted to control the operating recipe in accordance with a control
model, wherein the process controller is further adapted to receive a tool event notification and
initialize the control model in response to receiving the tool event notification, and the tool event
notification comprises a notification that the chamber has been cleaned.

45. (Previously Presented) A manufacturing system, comprising:

a tool adapted to process wafers in accordance with an operating recipe; and

a process controller adapted to control the operating recipe in accordance with a control
model, wherein the process controller is further adapted to receive a tool event notification and
initialize the control model in response to receiving the tool event notification, wherein the tool
comprises a photolithography stepper adapted to expose a photoresist layer on a semiconductor

wafer, and the tool event notification comprises a notification that a red-blue calibration has been performed on the photolithography stepper.